INTESTINAL STEM CELLS QUANTIFIED. ((G. Dawod, I. Kogan, J. Moody, L. Cosentino, P.B. Moens, C. Urlando, R.R. Swiger, R.J. Mauthe, J.D. Tucker, K.W. Turteltaub, and John A. Heddle)) Department of Biology, York University, Toronto, M3J 1P3, Canada and Biology and Biotechnology Research Program, Lawrence Livermore National Laboratory, Livermore, CA 94550-9900.

Mutational-tagging shows that there is one stem cell per crypt in the intestine, but the identity, position, and rate of proliferation of these cells have been uncertain. Since they typically divide slowly, stem cells will retain tagged nucleotides in their DNA longer than their more rapidly dividing progeny. Using accelerator mass spectrometry to detect the dilution of ^{14}C-labelled DNA, we find there is a population of slowly dividing cells with a half life of about 9 days. Using immunofluorescence to detect slowly dividing cells that retain 5'bromodeoxyuridine in DNA, we find that there is typically one such cell per crypt, just as expected from mutational-tagging. This putative stem cell can reside at many places within the proliferative zone. Supported by the National Cancer Institute of Canada and performed under the auspices of the U.S.D.O.E at the Lawrence Livermore National Laboratory under contract no. W-7405-ENG-48.